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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 12/04/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/542,473

Applicant(s)

IKEDA ET AL.

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35-42 is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-7, 10, 15, 17, 18, 20-28 and 30-33 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 8, 9, 16, 19, 29 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on September 5, 2001 has been entered and new claims 21-42 have been added.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 18 recites "portions of the second impurity regions". There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto US Patent No. 5,323,042 in view of Shimada et al. US Patent No. 5,528,056.

Matsumoto discloses in fig. 1 a display device comprising a pixel portion 12 and a driver portion 13 on the same substrate 11, said pixel portion comprising a semiconductor film comprising a channel forming region 21a, a plurality of impurity regions 21b, a source region 21c, and a drain region 21c; and a gate electrode 25

overlapping/partially overlapping with the channel forming region and some of the impurity regions, with a gate insulating film 24 interposed therebetween.

Shimada et al disclose (see fig. 2 and col. 6, lines 54-65) a plurality of channel regions 16 and a plurality of impurity regions wherein some of the impurity regions are located between the plurality of the channel regions in the semiconductor film.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Shimada et al with Matsumoto's device, since that would enhance the density of the device.

In regards to claims 2 and 22, although the prior art discloses impurity regions containing elements or elements that belong to group XV (as in claim 22) at a concentration different than the concentration recited in the claim, it would have been obvious to optimize the device by using a workable range which involves only a routine skill in the art. Further, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

As to claim 21, Matsumoto discloses (see col. 4, lines 3-8 and 23-29) impurity regions having the same conductivity as the source and drain regions.

5. Claims 6-7 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto US Patent No. 5,323,042 in view of Shimada et al. US Patent No. 5,528,056.

Matsumoto discloses in fig. 1 a display device comprising a pixel portion 12 and a driver portion 13 on the same substrate 11, said pixel portion comprising a semiconductor film comprising a channel forming region 21a, a plurality of low concentration impurity regions 21b, a source region 21c, and a drain region 21c; and a gate electrode 25 overlapping/partially overlapping with the channel forming region and some of the low concentration impurity regions, with a gate insulating film 24 interposed therebetween.

Shimada et al disclose (see fig. 2 and col. 6, lines 54-65) a plurality of channel regions 16 and a high concentration impurity region wherein the high concentration impurity region is located between the plurality of the channel forming regions in the semiconductor film.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Shimada et al with Matsumoto's device, since that would enhance the density of the device. It would have been obvious to locate some low concentration impurity regions between the plurality of the channel regions in the semiconductor film or to locate a pair of low concentration impurity regions under the gate electrode (as in claim 24), since that would minimize hot carrier effects.

In regards to claim 7, although the prior art discloses low concentration impurity and high concentration regions contain elements or elements that belong to group XV (as in claim 25) at a concentration different than the concentration recited in the claim, it would have been obvious to optimize the device by using a workable range which

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involves only a routine skill in the art. Further, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

As to claim 23, Matsumoto (see col. 4, lines 3-8 and 23-29) and Shimada et al (see col. 7, lines 13-18) impurity regions having the same conductivity as the source and drain regions.

6. Claims 15 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto US Patent No. 5,323,042 in view of Shimada et al. US Patent No. 5,528,056.

Matsumoto discloses in fig. 1 a display device comprising a pixel portion 12 and a driver portion 13 on the same substrate 11, said pixel portion comprising a semiconductor film comprising a channel forming region 21a, at least one first impurity region 21b, at least one second impurity region 21b, a source region 21c, and a drain region 21c; and a gate electrode 25 overlapping/partially overlapping with the channel forming region and first impurity region 21b, and part of the second impurity region, with a gate insulating film 24 interposed therebetween.

Shimada et al disclose (see fig. 2 and col. 6, lines 54-65) at least two channel forming regions 16 and first and second impurity regions 25,26 wherein the channel

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forming region is located between the first impurity region and second impurity region in the semiconductor film.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Shimada et al with Matsumoto's device, since that would enhance the density of the device.

As to claim 26, Matsumoto discloses (see col. 4, lines 3-8 and 23-29) first and second impurity regions 21b having the same conductivity as the source and drain regions.

In regards to claims 27 and 28, the prior art discloses first and second impurity regions and a third impurity region containing an element belonging to group XV in the periodic table (as in claim 28) but discloses a concentration different than the concentration recited in the claim. However, it would have been obvious to optimize the device by using a workable range which involves only a routine skill in the art. Further, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

7. Claims 18 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto US Patent No. 5,323,042 in view of Shimada et al. US Patent No. 5,528,056.

Matsumoto discloses in fig. 1 a display device comprising a pixel portion 12 and a driver portion 13 on the same substrate 11, said pixel portion comprising a semiconductor film comprising a channel forming region 21a, first and second low concentration impurity regions 21b, a source region 21c, and a drain region 21c; and a gate electrode 25 overlapping/partially overlapping with the channel forming region, the first low concentration impurity region and portion of the second low concentration impurity, with a gate insulating film 24 interposed therebetween.

Shimada et al disclose (see fig. 2 and col. 6, lines 54-65) at least two channel regions 16 and a high concentration impurity region 29 wherein the high concentration impurity region is located between the channel forming regions in the semiconductor film.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Shimada et al with Matsumoto's device, since that would enhance the density of the device. It would have been obvious to locate the high concentration impurity region between a pair of low concentration impurity regions under the gate electrode (as in claim 31), since that would minimize hot carrier effects.

As to claim 30, Matsumoto (see col. 4, lines 3-8 and 23-29) and Shimada et al (see col. 7, lines 13-18) first and second concentration impurity regions and a high concentration impurity region having the same conductivity as the source and drain regions.



As to claims 32 and 33, the prior art discloses first and second concentration impurity regions and a high concentration impurity region containing an element belonging to group XV in the periodic table (as in claim 33) but discloses a concentration different than the concentration recited in the claim. However, it would have been obvious to optimize the device by using a workable range which involves only a routine skill in the art. Further, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

As for claims 5, 10, 17 and 20, the prior art omits that electronic equipment selected from the group consisting of a video camera, a digital camera and other various electronic equipment. However, Examiner takes Official Notice that an electronic equipment comprising a display device wherein said electronic equipment selected from the group consisting of a video camera or a digital camera is conventional and well known. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have used any of the various electronic equipment since Examiner takes Official Notice that due to their low power consumption, displays have become a necessary and indispensable structural element of an electronic equipment.

***Allowable Subject Matter***

8. Claims 35-42 are allowed.

9. Claims 2-4, 8-9, 16, 19, 22, 29 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Inoue (JP-11-97701) discloses a TFT comprising a plurality of channel regions located between a plurality of impurity regions and a gate electrode overlapping the plurality of channel regions.

b. Yamazaki et al. (EP 989614 A2) disclose an electronic equipment comprising a display device selected from digital cameras, video cameras etc.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (703) 605-1227.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on (703) 308-6601.

ANS

December 2, 2001

Nathan Flynn  
Primary Examiner

A handwritten signature in black ink, appearing to be 'Nathan Flynn', written over a horizontal line.